REMARKS

This paper is being provided in response to the Office Action mailed March 14, 2003, for the above-referenced application. In this response, Applicant has amended claims 1 and 6, 20 and 22 to clarify that which Applicant regards as the invention and has amended claims 21 and 23 to correct a typographical error. Applicant respectfully submits that the amendments to the claims are supported by the originally filed application.

The objection to the drawings has been addressed by the amendments to the claims contained herein. Applicant respectfully submits that the drawings show all of the features of the recited in the current claims. Accordingly, Applicant respectfully requests that this objection be reconsidered and withdrawn.

The rejections of claims 1-11, and 20-23 under 35 U.S.C. 112, first and second paragraphs, have been addressed by the amendments to the claims contained herein. Accordingly, Applicant respectfully requests that these rejections be reconsidered and withdrawn.

The rejection of claims 1, 3-6, 9-11, 20 and 22 under 35 U.S.C. 103(a) as being unpatentable over U.S. patent No. 5,439,835 to Gonzalez (hereinafter "Gonzalez") in view of U.S. Patent No. 5,545,575 to Cheng et al. (hereinafter "Cheng") is hereby traversed and reconsideration is respectfully requested in view of the amendments to the claims contained herein.

Applicant's claim 1, as amended herein, recites a semiconductor device with a gate electrode and first drain and source diffusion layers formed around the gate electrode and at least one sidewall that extends laterally. There are second drain and source diffusion layers surrounding the first drain and source electrodes and aligned to the sidewall. The sidewall has a horizontal offset extending by more than the vertical thickness of the lateral portion of the sidewall. At least one of the drain and source diffusion layers extend towards the gate electrode beyond an edge of the sidewall offset, and at least one of the drain and source diffusion layers extends no closer to the gate electrode than the edge of the sidewall offset. Claims 2-5, 20 and 21 depend directly or indirectly on independent claim 1.

Applicant's claim 6, as amended herein, recites a semiconductor device including a semiconductor substrate, an insulating film formed at a surface of the semiconductor substrate for defining device regions in each of which a semiconductor device is to be fabricated, and a gate electrode formed on the semiconductor substrate, the gate electrode and the insulating film defining lightly doped first drain and source diffusion layers. There is at least one sidewall covering the gate electrode, and heavily doped second drain and source diffusion layers formed at a surface of the semiconductor substrate around the gate electrode and aligned with the sidewall covering, with the first drain and source diffusion layers surrounding the second drain and source diffusion layers on at least a bottom and four lateral sides. The sidewall has a sidewall offset extending outwardly of the gate electrode along a horizontal surface of the semiconductor substrate in at least one region below which at least one of the second drain and source diffusion layers are

formed. The sidewall offset extends along a lateral surface of the gate oxide film on which the gate electrode is formed by an amount that is greater than the vertical thickness of the lateral surface of the sidewall, and there are low-resistive wiring layers formed at the surface of the drain and source diffusion layers, located outwardly beyond a peripheral edge of the sidewall and offset in at least one drain and source diffusion layer. At least one of the drain and source diffusion layers extends towards the gate electrode beyond an edge of the sidewall offset, and at least one of the drain and source diffusion layers extends no closer to the gate electrode than the edge of the sidewall offset. Claims 7-11, 22 and 23 depend directly or indirectly on independent claim 6.

The Gonzalez reference discloses a process for fabricating a CMOS DRAM using a high energy ion implantation of boron ions at a oblique angle for punch through protection. The graded junction 24B is formed by the oblique implantation. The junction of the diffusion is not aligned to the edge of the sidewall offset over gates 16 and 17.

The Cheng reference is used in the Office Action to show that first S/D diffusion may surround second S/D diffusions and have different diffusion concentrations. Cheng discloses an insulated gate semiconductor device having gate electrodes, and a source region 57 nested inside source region 43, etc. Openings in a layer of dielectric material 63 expose portions of the S/D regions to form Silicide 64.

Applicant's independent claims, as amended herein, all recite the feature that at least one of the drain and source diffusion layers extends towards the gate electrode

beyond an edge of the sidewall offset, and at least one of the drain and source diffusion layers extends *no closer to the gate electrode than the edge of the sidewall offset.* (See, for example, figures 3 and 4 and corresponding text). As stated on page 9, lines 11-16, of Applicant's specification, this structural configuration makes it possible to cause the source and drain diffusion layers of a transistor having a high breakdown voltage to be spaced away from an edge of a gate electrode. This prevents generation of a leakage current between bands, and hence, enhances a breakdown voltage between source and drain diffusion layers.

Applicant respectfully submits that neither Gonzalez nor Cheng teach or suggest at least this feature. Specifically, Gonzales does not even have a sidewall film relating to the diffusion, nor does the sidewall film that Gonzales does disclose extend laterally away from the gate by an amount greater than the thickness of the sidewall, as recited in the present independent claims. Gonzalez's figure 9 especially shows that the drain 24A near isolation region 13 is aligned to the gate electrode 16, and the isolation oxide 13, and not by the unlabeled sidewall film.

Applicant respectfully submits that Cheng does not overcome the above-noted deficiency of Gonzalez with respect to Applicant's claims. Arguably, Cheng does not disclose any structural limitations of a diffusion layer as established by a sidewall offset. Neither Gonzalez nor Change teach or suggest the recited feature where at least one of the drain and source diffusion layers extends towards the gate electrode beyond an edge of the sidewall offset, and at least one of the drain and source diffusion layers extends *no*

closer to the gate electrode than the edge of the sidewall offset. Accordingly, Applicant respectfully requests that this rejection be reconsidered and withdrawn.

The rejection of claim 7 under 35 U.S.C. 103(a) as being unpatentable over U.S. patent Gonzalez in view of Cheng and further in view of U.S. Patent No. 5,316,977 to Kunishima et al. (hereinafter "Kunishima") is hereby traversed and reconsideration is respectfully requested in view of the amendments to the claims contained herein.

Claim 7 depends from claim 6. The features of claim 6 have been discussed above.

The Kunishima reference is cited by the Office Action as disclosing the use of titanium silicide in a metal silicide layer.

Applicant respectfully submits that Kunishima does not overcome the above noted deficiencies of Gonzalez or Cheng with respect to Applicant's claims. Accordingly, Applicant respectfully requests that this rejection be reconsidered and withdrawn.

The rejection of claims 1-4, 6, 8-10, 21 and 23 under 35 U.S.C. 103(a) as being unpatentable over Cheng is hereby traversed and reconsideration is respectfully requested in view of the amendments to the claims contained herein.

The features of independent claims 1 and 6 have been discussed above with respect to Cheng. Accordingly, in view of the above, Applicant respectfully requests that this rejection be reconsidered and withdrawn.

The rejection of claims 5, 7, 11, 21, and 23 under 35 U.S.C. 103(a) as being unpatentable over Cheng in view of Kunishima is hereby traversed and reconsideration is respectfully requested in view of the amendments to the claims contained herein.

The features of independent claims 1 and 6 have been discussed above with respect to Cheng and Kunishima. Accordingly, in view of the above, Applicant respectfully requests that this rejection be reconsidered and withdrawn.

Based on the above, Applicant respectfully requests that the Examiner reconsider and withdraw all outstanding rejections and objections. Favorable consideration and allowance are earnestly solicited. Should there be any questions after reviewing this paper, the Examiner is invited to contact the undersigned at 617-248-4038.

Respectfully submitted,
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